## IN THE CLAIMS

Please amend the claims as indicated:

1	1.	(currently amended) A logging tool conveyed in a borehole for nuclear magnetic				
2		resonance (NMR) logging of an earth formation comprising:				
3		(a) a housing defining a longitudinal axis of the tool;				
4		(b) at least one sensor assembly coupled to the housing by a coupling device,				
5		a body of said at least one sensor assembly capable of being close to a				
6		wall of a borehole in the earth formation, said sensor assembly including				
7		(A) a magnet for providing which provides a static magnetic field in a				
8		sensitive region in said formation,				
9		(B) a transmitter coil for producing which produces a pulsed radio				
10		frequency (RF) magnetic field in said sensitive region, and,				
11		(C) at least one receiver coil for receiving which receives signals from				
12		nuclei in said sensitive region, said at least one receiver coil having				
13		an axis substantially parallel to an axis of said transmitter coil				
14		wherein an axial extent of the transmitter coil is greater than an axial extent of the				
15		at least one receiver coil.				
16						
1	2.	(original) The logging tool of claim 1 wherein said at least one sensor assembly				
2		further comprises a plurality of sensor assemblies circumferentially distributed				
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3		about said housing.
4		
1	3.	(previously presented) The logging tool of claim 1 wherein said coupling device
2		is operated by one of (i) a spring, (ii) hydraulic power, and, (iii) electrical power.
3		
1	4.	(original) The logging tool of claim 1 wherein said magnet is a U-shaped magnet
2		and further comprises:
3		(i) a first magnet and a second magnet having a magnetization direction
4		perpendicular to said longitudinal axis of the tool comprising arms of the
5		U, said first and second magnets having opposite directions of
6		magnetization, and
7		(ii) a magnetically permeable yoke forming the base of the U.
8		
1	5.	(original) The logging tool of claim 1 wherein said RF magnetic field is produced
2		by activating the transmitter coil with one of (i) a CPMG sequence, and, (ii) a
3		modified CPMG sequence having a refocusing angle less than 180°.
4		•
1	6.	canceled
2		
1	7.	(original) The logging tool of claim 1 wherein the at least one receiver coil further
2		comprises at least two receiver coils offset along the longitudinal axis.
3		
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1	8.	(currently amended) The logging tool of claim 1 further comprising a field
2		shifting electromagnet including a coil for adjusting which adjusts a position of
3		the sensitive region.
4		
1	9.	(original) The logging tool of claim 1 wherein the at least one receiver coil is
2		displaced towards the borehole wall from the transmitter coil
3		
1	10.	canceled
2		
1	11.	(original) The logging tool of claim 4 wherein a gap between ends of the first and
2`		second magnet away from the yoke is adjustable.
3		
1	12.	(currently amended) The logging tool of claim 1 further comprising a processor
2		for using which determines from the signals from the at least one receiver coil for
3		determining a parameter of interest of the earth formation.
4		
1	13.	(previously presented) The logging tool of claim 7 further comprising a processor
2		for using the signals from the at least two receiver coils for determining a
3		parameter of interest of the earth formation.
4		
1	14.	(original) The logging tool of claim 12 wherein the parameter of interest is at leas
2		one of (i) clay bound water, and, (ii) bulk volume irreducible.
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1	15.	(currently amended) A sensor assembly for nuclear magnetic resonance (NMR)	
2		measurements from a medium comprising:	
3		(a) a U-shaped magnet including a pair of magnets having opposed	
4		magnetization coupled by a permeable yoke for providing a static	
5		magnetic field in a sensitive region in the medium;	
6		(b) a transmitter coil for producing a pulsed radio frequency (RF) magnetic	
7		field in said sensitive region; and,	
8		(c) at least one receiver coil two spaced apart receiver coils which receive fe	Ŧ
9		receiving signals from nuclei in said sensitive region, said at least one	
10		two receiver soil coils having an axis axes substantially parallel to an ax	is
11		of said transmitter coil.	
12			
1	16.	(original) The sensor assembly of claim 15 wherein said RF magnetic field is	
2		produced by activating the transmitter coil with one of (i) a CPMG sequence, ar	ıd,
3		(ii) a modified CPMG sequence having a refocusing angle less than 180°.	
4			
1	17.	canceled	
2			
1	18.	(currently amended) The sensor assembly of claim 15 further comprising a field	i
2		shifting electromagnet including a coil for adjusting which adjusts a position of	f
3		the sensitive region.	
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		U	

7		
I	19.	(original) The sensor assembly of claim 15 wherein said transmitter coil is
2		positioned between the at least one receiver coil and the permeable yoke.
3		
1	20.	(original) The sensor assembly of claim 15 wherein a gap between ends of the
2		first and second magnet away from the yoke is adjustable.
3		
1	21.	(currently amended) The sensor assembly of claim 15 further comprising a
2		processor for using which determines from the signals from the at least one
3		two receiver coil coils for determining a parameter of interest of the earth
4		formation.
5		
1	22.	canceled
2		
1	23.	(previously presented)A method of determining a parameter of interest of an earth
2		formation comprising:
3		(a) conveying a logging tool having a longitudinal axis in a borehole in the
4		earth formation;
5		(b) using a U-shaped magnet on at least one sensor assembly for producing a
6		static magnetic field in a sensitive region in said formation, said at least
7		one sensor assembly coupled to a housing of the logging tool by an
8		coupling device;
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9		(b)	using a transmitter coil on the at least one solder assembly for products
10			pulsed radio frequency (RF) magnetic field in said sensitive region; and,
11		(c)	using at least one receiver coil on the at least one sensor assembly for
12			receiving signals from nuclei in said sensitive region, said at least one
13			receiver coil having an axis substantially parallel to an axis of said
14			transmitter coil.
15			
1	24.	(orig	inal) The method of claim 23 wherein said at least one sensor assembly
2		furth	er comprises a plurality of sensor assemblies circumferentially distributed
3		abou	t said housing; the method further comprising obtaining information about an
4		azim	uthal variation of said parameter of interest.
5			
1	25.	(pre	viously presented) The method of claim 23 further comprising operating the
2		cour	oling device by one of (i) a spring, (ii) hydraulic power, and, (iii)
3		elec	trical power.
4			
1	26.	(ori	ginal) The method of claim 23 wherein said U-shaped magnet further
2		соп	nprises:
3		(i)	a first magnet and a second magnet having a magnetization direction
4			perpendicular to said longitudinal axis of the tool comprising arms of the
5			U, said first and second magnets having opposite directions of
6			magnetization, and
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7		(ii) a magnetically permeable yoke forming the base of the U.
3		
1	27.	(original) The method of claim 23 wherein producing said pulsed RF magnetic
2		field further comprises modulating a RF signal by one of (i) a CPMG sequence,
3		and, (ii) a modified CPMG sequence having a refocusing angle less than 180°.
4		
1	28.	(original) The method of claim 23 wherein said RF magnetic field has a field
2		direction substantially orthogonal to said longitudinal axis and to a direction of
3		the static magnetic field in said sensitive volume.
4		
1	29.	(original) The method of claim 23 wherein the at least one receiver coil further
2		comprises at least two receiver coils offset along the longitudinal axis.
3		
1	30.	(original) The method of claim 23 further comprising using a field shifting
2		electromagnet including a coil for adjusting a position of the sensitive region in
3		the formation.
4		
1	31.	(original) The method of claim 23 wherein the transmitter coil has a greater length
2		along the longitudinal axis than the at least one receiver coil, the method further
3		comprising moving the logging tool along the longitudinal axis while making
4		continuing measurements.
5		

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1	32.	(original) The method of claim 23 further comprising adjusting a gap between
2		ends of the first and second magnet away from the yoke and adjusting a position
3		of the sensitive region.
4		
1	33.	(previously presented) The method of claim 23 further comprising using a
2		processor for determining from the signals from the at least one receiver coil the
3		parameter of interest of the earth formation.
4		
1	34.	(previously presented) The method of claim 29 further comprising using a
2		processor for determining from the signals from the at least two receiver coils the
3		parameter of interest of the earth formation.
4		
1	35.	(original) The method of claim 23 wherein the parameter of interest comprises at
2		least one of (i) clay bound water, and, (ii) bulk volume irreducible.
3		
1	36.	(original) The method of claim 24 wherein the plurality of sensor assemblies
2		comprises three, and wherein the parameter of interest comprises bound volume
3		irreducible, the method further comprising determining a dip and azimuthal
4		direction of the formation.
5		
1	37.	(previously presented) The method of claim 24 wherein the plurality of sensor
2		assemblies comprises three, and wherein the parameter of interest comprises clay
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3		bound water, the method further comprising determining a dip and azimuthal
4		orientation of shale laminations.
5		
1	38.	(original) The method of claim 24 wherein the plurality of sensor assemblies
2		comprises three and wherein the parameter of interest comprises clay bound water
3		and bulk volume irreducible, the method further comprising determining dip and
4		cross-bedding of the formation.
5		
1	39.	(original) The method of claim 30 further comprising repeating steps (a) - (c) for a
2		different positions of the sensitive region using a phase alternated pulse sequence.
3		
1	40.	(original) The method of claim 35 wherein producing said pulsed RF magnetic
2		field further comprises modulating a RF signal with a modulating signal that is
3		one of (A) a CPMG sequence, and, (B) a modified CPMG sequence having a
4		refocusing angle less than 180°.
5		
1	41.	(original) The method of claim 40 wherein said modulating signal includes short
2		interecho spacings for determining a rapidly decaying component of a T2
3		distribution.
4		
1	42.	(currently amended) A method of determining a parameter of interest of a
2		medium comprising:
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polarization coupled by a magnetically permeable yoke for producing a static magnetic field in a sensitive region in the medium;  (b) using a transmitter coil for producing a pulsed radio frequency (RF) magnetic field in said sensitive region; and,  (c) using at least one receiver coil two receiver coils having an axis  axes substantially parallel to an axis of said transmitter coil for receiver signals from nuclei in said sensitive region.  (original) The method of claim 42 wherein producing said pulsed RF magnet and, (ii) a modified CPMG sequence having a refocusing angle less than 1800  (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction the static magnetic field in said sensitive volume.	3		a) using a U-shaped magnet including a pair of magnets with opposed	
(b) using a transmitter coil for producing a pulsed radio frequency (RF) magnetic field in said sensitive region; and,  (c) using at least one receiver coil two receiver coils having an axis axes substantially parallel to an axis of said transmitter coil for receiving signals from nuclei in said sensitive region.  (original) The method of claim 42 wherein producing said pulsed RF magnetic field further comprises modulating a RF signal by one of (i) a CPMG sequence and, (ii) a modified CPMG sequence having a refocusing angle less than 180° (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction the static magnetic field in said sensitive volume.  4 45. canceled	4		polarization coupled by a magnetically permeable yoke for producing	a
magnetic field in said sensitive region; and,  (c) using at least one receiver coil two receiver coils having an axis  axes substantially parallel to an axis of said transmitter coil for receiving signals from nuclei in said sensitive region.  (original) The method of claim 42 wherein producing said pulsed RF magnetic field further comprises modulating a RF signal by one of (i) a CPMG sequence and, (ii) a modified CPMG sequence having a refocusing angle less than 180°  (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction the static magnetic field in said sensitive volume.	5		static magnetic field in a sensitive region in the medium;	
axes substantially parallel to an axis of said transmitter coil for receiving signals from nuclei in said sensitive region.  (original) The method of claim 42 wherein producing said pulsed RF magnetic field further comprises modulating a RF signal by one of (i) a CPMG sequence and, (ii) a modified CPMG sequence having a refocusing angle less than 180° (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction the static magnetic field in said sensitive volume.	6		b) using a transmitter coil for producing a pulsed radio frequency (RF)	
axes substantially parallel to an axis of said transmitter coil for receiving signals from nuclei in said sensitive region.  (original) The method of claim 42 wherein producing said pulsed RF magnetic field further comprises modulating a RF signal by one of (i) a CPMG sequence and, (ii) a modified CPMG sequence having a refocusing angle less than 180° (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction of the static magnetic field in said sensitive volume.  4 45. canceled	7		magnetic field in said sensitive region; and,	
signals from nuclei in said sensitive region.  (original) The method of claim 42 wherein producing said pulsed RF magnet field further comprises modulating a RF signal by one of (i) a CPMG sequence and, (ii) a modified CPMG sequence having a refocusing angle less than 1800 direction substantially orthogonal to said longitudinal axis and to a direction the static magnetic field in said sensitive volume.  4 45. canceled	8		(c) using at least one receiver coil two receiver coils having an axis	
1 43. (original) The method of claim 42 wherein producing said pulsed RF magnet field further comprises modulating a RF signal by one of (i) a CPMG sequence and, (ii) a modified CPMG sequence having a refocusing angle less than 180° 4  4 44. (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction the static magnetic field in said sensitive volume.  4 45. canceled	9		axes substantially parallel to an axis of said transmitter coil for receiving	ing
1 43. (original) The method of claim 42 wherein producing said pulsed RF magnetic field further comprises modulating a RF signal by one of (i) a CPMG sequence and, (ii) a modified CPMG sequence having a refocusing angle less than 1800 decrease.  4 44. (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction of the static magnetic field in said sensitive volume.  4 45. canceled	0		signals from nuclei in said sensitive region.	
field further comprises modulating a RF signal by one of (i) a CPMG sequence and, (ii) a modified CPMG sequence having a refocusing angle less than 180°  (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction the static magnetic field in said sensitive volume.  canceled  canceled	1			
and, (ii) a modified CPMG sequence having a refocusing angle less than 180°0 4 1 44. (original) The method of claim 42 wherein said RF magnetic field has a field 2 direction substantially orthogonal to said longitudinal axis and to a direction of the static magnetic field in said sensitive volume. 4 1 45. canceled 2	1	43.	(original) The method of claim 42 wherein producing said pulsed RF magne	tic
4 44. (original) The method of claim 42 wherein said RF magnetic field has a field direction substantially orthogonal to said longitudinal axis and to a direction the static magnetic field in said sensitive volume.  4 45. canceled  2	2		field further comprises modulating a RF signal by one of (i) a CPMG sequence	ce,
1 44. (original) The method of claim 42 wherein said RF magnetic field has a field 2 direction substantially orthogonal to said longitudinal axis and to a direction of 3 the static magnetic field in said sensitive volume. 4 1 45. canceled 2	3		and, (ii) a modified CPMG sequence having a refocusing angle less than 180	0
direction substantially orthogonal to said longitudinal axis and to a direction of the static magnetic field in said sensitive volume.  1 45. canceled 2	4			
the static magnetic field in said sensitive volume.  4  1 45. canceled	1	44.	(original) The method of claim 42 wherein said RF magnetic field has a field	L
4 1 45. canceled 2	2		direction substantially orthogonal to said longitudinal axis and to a direction	of
1 45. canceled 2	3		the static magnetic field in said sensitive volume.	
2	4			
	1	45.	canceled	
1 46. (original) The method of claim 42 further comprising using a field shifting	2			
	1	46.	(original) The method of claim 42 further comprising using a field shifting	
2 electromagnet including a coil for adjusting a position of the sensitive region	2		electromagnet including a coil for adjusting a position of the sensitive region	n in
3 the formation.	3		the formation.	
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i	47.	(original) The method of claim 42 further comprising adjusting a gap between
2		ends of the first and second magnet away from the yoke and adjusting a position
3		of the sensitive region.
4		
1	48.	(currently amended) The method of claim 42 further comprising using a processor
2		for determining from the signals from the at least one two receiver coil coils the
3		parameter of interest of the earth formation.
4		
1	49.	(original) The method of claim 46 further comprising repeating steps (a) - (c) for
2		a different position of the sensitive region using a phase alternated pulse
3		sequence.
4		
1	50.	canceled
2		
1	51.	canceled
2		
1	52.	(previously presented) The logging tool of claim 7 wherein said at least one senso
2		assembly is adapted to be rotated to a position wherein said at least two receiver
3		coils are at substantially the same longitudinal position
4	<b>!</b> ,	
į	53	(previously presented) The method of claim 29 further comprising:
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2		(i)	rotating said sensor assembly to position said at least two receiver coils at
3			substantially the same longitudinal position; and
4		(ii)	obtaining said signals with an increased azimuthal resolution.
5			
1	54.	(previ	ously presented) The logging tool of claim 1 wherein said magnet has a
2		higher	magnetization at an end than at a middle portion of said magnet.
3 1	55.	(new)	A sensor assembly for nuclear magnetic resonance (NMR) measurements
2		from	a medium comprising:
3		(a)	a U-shaped magnet including a pair of magnets having opposed
4			magnetization coupled by a permeable yoke which provides a static
5			magnetic field in a sensitive region in the medium;
6		(b)	a transmitter coil producing a pulsed radio frequency (RF) magnetic
7			field in said sensitive region;
8		(c)	a field shifting magnet which alters a position of the sensitive region; and
9		(d)	at least one receiver coil for receiving signals from nuclei in said sensitiv
10			region, said at least one receiver coil having an axis substantially parallel
11			to an axis of said transmitter coil.
12 1	56.	A m	ethod of determining a parameter of interest of a medium comprising:
2		(a)	using a U-shaped magnet including a pair of magnets with opposed
3			polarization coupled by a magnetically permeable yoke for producing a
4			static magnetic field in a sensitive region in the medium;

5	(b)	using a transmitter coil for producing a pulsed radio frequency (RF)
6		magnetic field in said sensitive region;
7	(c)	using a field shifting magnet to alter a position of the sensitive region; and
8	(d)	using at least one receiver coil having an axis substantially parallel to an
9		axis of said transmitter coil for receiving signals from nuclei in said
10		sensitive region.